

## PATENT CLAIMS (amended on 01.06.2005)

1. A power semiconductor module comprising
  - at least one semiconductor chip (11) made of a semiconductor material and having a first and a second main electrode,
  - a first and second main connection (91, 92),
  - a contact lamina (2) in electrical contact with the first main electrode and the first main connection (92),
  - the contact lamina (2) containing an alloying partner and it being possible for a eutectic to be formed between the alloying partner and the semiconductor material,
  - 15 - the contact lamina being coated with an electrically conductive protective layer (31, 32), characterized in that
    - the protective layer (31, 32) has at least one electrically conductive base layer (31) applied on the contact lamina (2), and
    - an electrically conductive surface layer (32), which forms the external contact area,
  - 20 and in that
    - the base layer and the surface layer substantially comprise different materials.
2. The power semiconductor module as claimed in claim 1, characterized in that
  - the base layer (31) substantially comprises Ni and preferably has a thickness of between approximately 1  $\mu\text{m}$  and 15  $\mu\text{m}$ , preferably between 2  $\mu\text{m}$  and 8  $\mu\text{m}$ .
3. The power semiconductor module as claimed in claim 1 or 2, characterized in that
  - the surface layer (32) has a thickness of between approximately 0.1  $\mu\text{m}$  and 5  $\mu\text{m}$ .

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4. The power semiconductor module as claimed in one of claims 1 to 3, characterized in that

- the surface layer (32) substantially comprises Ru,
- an electrically conductive intermediate layer is provided between the surface layer (32) and the base layer (31), said intermediate layer substantially comprising Au and preferably having a thickness of approximately 0.2  $\mu\text{m}$ , and
- the base layer (31) preferably has a thickness of between 5  $\mu\text{m}$  and 12  $\mu\text{m}$ .

5. The power semiconductor module as claimed in one of the preceding claims, characterized in that

- the semiconductor chip (11) internally has an IGBT structure or a diode structure.

6. The power semiconductor module as claimed in claim 1, characterized in that

- the base layer (31) comprises a good covering material, and in that
- the surface layer (32) comprises a material having one or more of the following properties:
  - a non-oxidizable, preferably exhibiting little chemical reactivity,
  - b does not react chemically with a first electrode metallization of the first main electrode and exhibits neither contact corrosion nor material diffusion,
  - c has a low coefficient of friction,
  - d can be deposited at temperatures at which the contact layer is not damaged or deformed.